

WHAT IS CLAIMED IS:

1. An image processing apparatus, which uses input tone data for a first color space image to generate reproduction data that express a halftone for an image, comprising:

5 a color converter, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said first color space into tone data for a second color space; and

10 a halftone processor for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of said tone data for said second color space and said image reproduction data,

15 wherein a gamma characteristic A, for said input tone data for said first color space, for an output density relative to a tone value for each brightness level of an image corresponds to a gamma characteristic B, for said halftone table, for an output density relative to a tone value for each brightness level of an image.

20 2. An image processing apparatus according to claim 1, wherein said first color space is a color space for an additive mixture of color stimuli, and said second color space is a color space for a subtractive mixture of color stimuli; and
25 wherein a difference, for said gamma characteristic A, between a ratio for a first input tone area of the change of said output density to the change of an input tone value, and a ratio for

a second input tone area of the change of said output density to the change of an input tone value, which is lower than said input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B, between a ratio for a third input tone area of the change of said output density to the change of an input tone value, and a ratio for a fourth input tone area of the change of said output density to the change of an input tone value, which is higher than said input tone value for said third input tone area.

3. An image processing apparatus according to claim 1, wherein said first color space is a color space for a subtractive mixture of color stimuli, and said second color space is a color space for a subtractive mixture of color stimuli; and wherein a difference, for said gamma characteristic A, between a ratio for a first input tone area of the change of said output density to the change of an input tone value, and a ratio for a second input tone area of the change of said output density to the change of an input tone value, which is lower than said input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B, between a ratio for a third input tone area of the change of said output density to the change of an input tone value, and a ratio for a fourth input tone area of the change of said output density to the change of an input tone value, which is lower than said input tone value for said third input tone area.

4. An image processing apparatus according to claim 2, wherein said color space for said additive mixture of color stimuli is either an RGB color space, an sRGB color space, a CIEXYZ color space or a CIELab color space, and said color space for said subtractive mixture of color stimuli is a CMYK color space.

5. An image processing apparatus according to claim 3, wherein said color space for said subtractive mixture of color stimuli is a CMYK color space.

6. An image processing apparatus according to claim 1, wherein said first color space is either an RGB, an sRGB or a CIELab color space, and said second color space is a CMYK color space; wherein, for said gamma characteristic A, a ratio in a first input tone area for the change in said output density to the change in an input tone value is smaller than a ratio in a second input tone area for the change in said output density to the change in an input tone value, which is lower than said input tone value in said first input tone area; and wherein, for said gamma characteristic B, a ratio in a third input tone area for the change in said output density to the change in an input tone value is greater than a ratio in a fourth input tone area for the change in said output density to the change in an input tone value, which is lower than said input tone value in said third input tone area.

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7. An image processing apparatus according to claim 1, wherein said first color space is a first CMYK color space, and said second color space is a second CMYK color space; wherein, for said gamma characteristic A, a ratio in a first input tone area for the change in said output density to the change in an input tone value is smaller than a ratio in a second input tone area for the change in said output density to the change in an input tone value, which is lower than said input tone value in said first input tone area; and wherein, for said gamma characteristic B, a ratio in a third input tone area for the change in said output density to the change in an input tone value is smaller than a ratio in a fourth input tone area for the change in said output density to the change in an input tone value, which is lower than said input tone value in said third input tone area.

8. An image processing apparatus according to claim 1, wherein said gamma characteristic A and said gamma characteristic B have the same non-linear characteristic.

9. An image processing apparatus according to claim 1, wherein said gamma characteristic A and said gamma characteristic B have the same S-shaped characteristic.

10. An image processing apparatus according to claim 1, wherein said first color space is a CIE Lab color space and said second color space is a CMYK color space, and wherein

a gamma characteristic of L^* is the same as a gamma characteristic of said halftone table.

11. An image processing apparatus according to claim
5 1, wherein said first color space is a CIE Lab color space or a CIE XYZ color space, and said second color space is a CMYK color space.

12. An image processing apparatus according to claim
10 1, wherein said color conversion table includes a discrete relationship between said input tone data for said first color space and said tone data for said second color space; and wherein said halftone table includes a continuous relationship between
15 said input tone data for said first color space and said tone data for said second color space.

13. An image processing apparatus for generating, using
input tone data for an RGB color space, image reproduction
data that express tones by using a plurality of printing dots
20 comprising:

a color converter, for performing an interpolation process,
for referring to a color conversion table to convert said input
tone data for said RGB color space into tone data for a CMYK
color space; and

25 a halftone processor for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of

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said tone data for said CMYK color space and said image reproduction data,

wherein, for a gamma characteristic A for an output density relative to a tone value of said input tone data for said RGB color space, a difference between a ratio for a first RGB tone area of the change of said output density to the change of an input tone value, and a ratio for a second RGB tone area of the change of said output density to the change of an input tone value, which is lower than said input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B of said halftone table, between a ratio for a first CMYK input tone area of the change of said output density to the change of an input tone value, and a ratio for a second CMYK input tone area of the change of said output density to the change of an input tone value, which is higher than said input tone value for said first CMYK input tone area.

14. An electrophotographic apparatus comprising:
an image processing apparatus according to claim 1; and
a print engine for printing an image in accordance with image reproduction data.

15. An electrophotographic apparatus comprising:
an image processing apparatus according to claim 13; and
a print engine for printing an image in accordance with image reproduction data.

16. An electrophotographic apparatus according to claim 14, wherein said print engine emits a laser beam in accordance with said image reproduction data to form a latent image, and attaches toner for said color space to said latent image.

17. An electrophotographic apparatus according to claim 15, wherein said print engine emits a laser beam in accordance with said image reproduction data to form a latent image, and attaches toner for said color space to said latent image.

18. A recording medium for storing an image processing program that permits a computer to perform image processing for generating, using input tone data for a first color space, image reproduction data that express image halftones, said image processing comprising:

a color conversion process, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said first color space into tone data for a second color space; and

a halftone process for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of said tone data for said second color space and said image reproduction data,

wherein a gamma characteristic A, for said input tone data for said first color space, for an output density relative to a tone value for each brightness level of an image corresponds

to a gamma characteristic B, for said halftone table, for an output density relative to a tone value for each brightness level of an image.

5 19. A recording medium for storing an image processing program that permits a computer to perform image processing for generating, using input tone data for an RGB color space, image reproduction data that express tones by using a plurality of printing dots, said image processing comprising:

10 a color conversion process, for performing an interpolation process, for referring to a color conversion table to convert said input tone data for said RGB color space into tone data for a CMYK color space; and

15 a halftone process for converting said tone data for said second color space into image reproduction data, by referring to a halftone table that shows the correlation of said tone data for said CMYK color space and said image reproduction data,

20 wherein, for a gamma characteristic A for an output density relative to a tone value of said input tone data for said RGB color space, a difference between a ratio for a first RGB tone area of the change of said output density to the change of an input tone value, and a ratio for a second RGB tone area of the change of said output density to the change of an input
25 tone value, which is lower than said input tone value for said first input tone area, is the same as a difference, for said gamma characteristic B of said halftone table, between a ratio

for a first CMYK input tone area of the change of said output density to the change of an input tone value, and a ratio for a second CMYK input tone area of the change of said output density to the change of an input tone value, which is higher
5 than said input tone value for said first CMYK input tone area.

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